ABSTRACT

The present invention provides an apparatus and method for performing precision, positive, and permanent anastomosis of blood vessels which makes use of miniature appliance/applicators that execute the anastomosis procedures under the control of the surgeon and the surgical team. The appliance/applicators are constructed in various sizes and configurations to accommodate the wide variations in size of the tubular body members and the various anastomosis types (end-to-end, end-to-side, and side-to-side joining). The apparatus features a surgeon's manipulator wand to which the surgeon attaches the appropriate type and size appliance/applicator. Using the wand, the surgeon positions and actuates the applicator which then automatically performs several sequential steps to attach the appliance and effect a precise and uniform anastomosis of the tubular members. The surgeon's wand contains the actuators, servos, and sensors that operate the appliance/applicator in response to commands from the surgeon. The appliance portion of the appliance/applicator consists of a plurality of connectable grippers designed for the particular type of anastomosis being performed and remains in the patient as a permanent part of the joined tubular members, with the applicator part being withdrawn and discarded after the procedure is complete. The apparatus further comprises a support and positioning arm assembly, a mobile console housing the various elements and power source and a computer providing automated control of the apparatus and process as well as inventory of the appliance/applicator kits.